

CLAIMS

What is claimed is:

1. A protection circuit in a load adapted to test an electrical energy generation device, the load including a plurality of field effect transistors coupled in parallel, the circuit comprising:

- a. means for sensing one or more operational parameters of a field effect transistor in the load; and
- b. means for adjusting the current through the field effect transistor in response to the one or more sensed parameters to prevent the transistor from operating outside its safe operating area.

2. The circuit of claim 1, wherein the parameter comprises operating current of the field effect transistor.

3. The circuit of claim 1, wherein the parameter comprises a temperature associated with the field transistor.

4. The circuit of claim 1, further comprising:

- a. means for sensing one or more operational parameters of each of the plurality of field effect transistors in the load individually; and
- b. means for adjusting the current through each of the plurality of field effect transistors individually in response to the respective one or more sensed parameters.

5. The circuit of claim 1, wherein the means for sensing is a passive component having a characteristic parameter that is a function of the operational parameter.

6. The circuit of claim 5, wherein one of said one or more operational parameters is temperature.
7. The circuit of claim 5, wherein one of said one or more operational parameters is current.
8. The circuit of claim 1, wherein the means for sensing is an active component.
9. The circuit of claim 1, wherein the means for sensing comprises a resistor having a predetermined temperature coefficient.
10. The circuit of claim 1, further comprising an analog feedback loop in the load whose output changes with changes in the resistance of the load.
11. The circuit of claim 10, wherein the feedback loop comprises:
 - a. a shunt in series with the load;
 - b. an operational amplifier having its inverting input coupled to one end of the shunt; and
 - c. the non-inverting input of the operational amplifier coupled to a voltage source referenced to the other end of the shunt.
12. The circuit of claim 11, wherein the output of the operational amplifier provides a control signal to the gates of the field effect transistors of the load.
13. The circuit of claim 10, further comprising a digital programmable device providing a control signal to the analog feedback loop to alter the operation of the feedback loop.
14. A system for testing an energy generation device, the system comprising:

- a. a load comprising a plurality of field effect transistors coupled in parallel, the load including a positive input terminal and a negative input terminal;
- b. a pair of electrical nodes to receive an energy generation device under test, with a first node coupled to the positive input terminal of the load, and a second node coupled to the negative input terminal of the load through a resistive element;
- c. a means for sensing the voltage drop across the resistive element;
- d. a difference amplifier to receive the sensed voltage drop across the resistive element and to provide an output which is a function of the sensed voltage drop;
- e. a control element coupled to the positive input terminal of the load, the control element further providing a control signal to a first input to the load; and
- f. a feedback amplifier to receive the output of the difference amplifier and a control signal from the control element, the feedback amplifier providing a second input to the load.

15. The system of claim 14, further comprising an amplifier to receive the sensed voltage drop across the resistive element and to provide an output to the control element, whereby the control element alters the control signal to the first input of the load in response to a change in the sensed voltage drop.

16. The system of claim 14, further comprising a temperature sensor for sensing the operational temperature of the field effect transistors and to provide a sensed temperature signal to the control element to alter the control signal to the first input of the load in response to a change in the sensed temperature.

17. In a system for testing an energy generation device, the system including a plurality of field effect transistors coupled in parallel to define a load, a method of protecting the field effect transistors comprising the steps of:

- a. sensing one or more operational parameters of each of the field effect transistors, and
- b. modifying a control signal.